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BIOLOGICAL SOCIETY OF WASHINGTON

MONOGENETIC TREMATODES FROM THE
SOUTHERN PACIFIC OCEAN. PART IV.
POLYOPISTHOCOTYLEIDS FROM NEW ZEALAND
FISHES: THE FAMILIES MAZOCRAEIDAE,
DICLIDOPHORIDAE AND HEXABOTHRIIDAE¹

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This is the fourth paper of a series on monogenetic trematodes of fishes of the southern Pacific Ocean. This installment deals specifically with several species belonging to the families Mazocraeidae Price, 1936, Diclidophoridae Cerfontaine, 1895, and Hexabothriidae Price, 1942 of New Zealand fishes. The scope, organization, and purpose are the same as for the first installment.

Materials and Methods: Methods used in the preservation and the preparation of the monogenetic flukes for identification and study are essentially the same as those given by Dillon and Hargis (1965).

All measurements were made with the use of a filar micrometer and are given in microns unless otherwise noted. In indicating these measurements the mean is given, followed by the range (minimum and maximum) in parentheses. The number of measurements used in the calculations appears in parentheses before these data. Measurements of curved structures are across the lines subtending the greatest arcs described by those structures.

In the measurements to follow, length—of the body, its appendages and most internal organs—refers to the distance along the anteroposterior axis except where otherwise noted. Width refers to a measurement made

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at right angles to the length, i.e., along the dextrosinistral axis. The lengths of cirri, accessory pieces, genital ducts, anchors, hooks, and spines are along the longest axes of those structures regardless of orientation.

Clamps, because of their differing shapes and variable orientation in relation to the anteroposterior axis of the body, present special problems. In this installment, the length of clamps is regarded as the greatest dimension of the sclerotized framework; the width is taken as the greatest dimension at right angles to the length.

Camera lucida drawings were used to facilitate identification and in preparation of the plates.

SUBORDER POLYOPISTHOCOTYLEA ODHNER, 1912

SUPERFAMILY DICLIDOPHOROIDEA PRICE, 1936

FAMILY MAZOCRAEIDAE PRICE, 1936

Neogrubeinae new subfamily

Diagnosis: Mazocraeidae. Body elongate, merging inconspicuously with posthaptor. Prohaptor a pair of buccal suckers placed laterally in walls of buccal funnel. Posthaptor armed with four pairs of clamps and two pairs of anchors; clamps similar in framework, unequal in size; clamps on one side of body (usually right side) open, large, with center piece of clamp parallel to dextrosinistral axis; clamps on other side of body smaller, closed, with center piece of clamp parallel to anteroposterior axis and at right angles to the large, open clamps. Clamps of a modified mazocraeid-type; anchors *Kuhnia*-like, dissimilar in size. Testes numerous, pre-, para-, and postovarian, extending into posthaptor. Ovary tubular, folded, with mature end directed anteriorly. Vagina apparently absent. Genital atrium armed as in *Kuhnia*. Eggs with filaments at both poles.

Type Genus: *Neogrubea* new genus.

Discussion: Of the six subfamilies (Clupeocotylinae, Grubeinae, *Kuhninae*, Mazocraeinae, Mazocraeoidinae, and Neomazocraeinae) described by Price (1961), *Neogrubeinae* most closely resembles, as the name suggests, Grubeinae—especially in the following characters: (1) large, open modified mazocraeid-type clamps on one side, (2) much smaller, closed clamps on the opposite side, (3) clamp framework, (4) two pairs of dissimilar anchors, (5) *Kuhnia*-type genital atrium, and (6) eggs with filaments at both ends.

Neogrubeinae differs from Grubeinae as follows: (1) posthaptor with four pairs of clamps rather than four on one side and one on the other, (2) testes numerous, pre-, para-, and postovarian, extending into posthaptor, (3) vagina apparently absent, and (4) mature end of ovary directed anteriorly.

Although trematodes were recovered from *Seriolella porosa* Guichenot and *S. brama* (Gunther), the description herein is based only on that population from *S. porosa* since the specimens from *S. brama* were relatively immature and in poor condition. Comparison between the two

populations indicated that they were similar morphologically but differed in the size of most of the significant characters. A close study of good, mature specimens from *S. brama* should be undertaken in order to determine if the two populations under discussion are definitely conspecific.

Neogrubea new genus

Diagnosis: Neogrubeinae. With characters of the subfamily.

Type Species: *Neogrubea seriolellae* new species.

Neogrubea seriolellae new genus, new species

Figs. 1-6

Hosts: *Seriolella porosa* Guichenot (type host), Silver Warehou, and *S. brama* (Gunther), Warehou; family Stromateidae.

Location: Gills.

Localities: (1) Cape Campbell, Marlborough Province, South Island; 10 statute miles NE of Cape Campbell (60 fathoms; hard mud), and (2) Akaroa, Canterbury Province, South Island; Akaroa Harbour (4-10 fathoms; mud-sand-mussels).

Number Studied: 50.

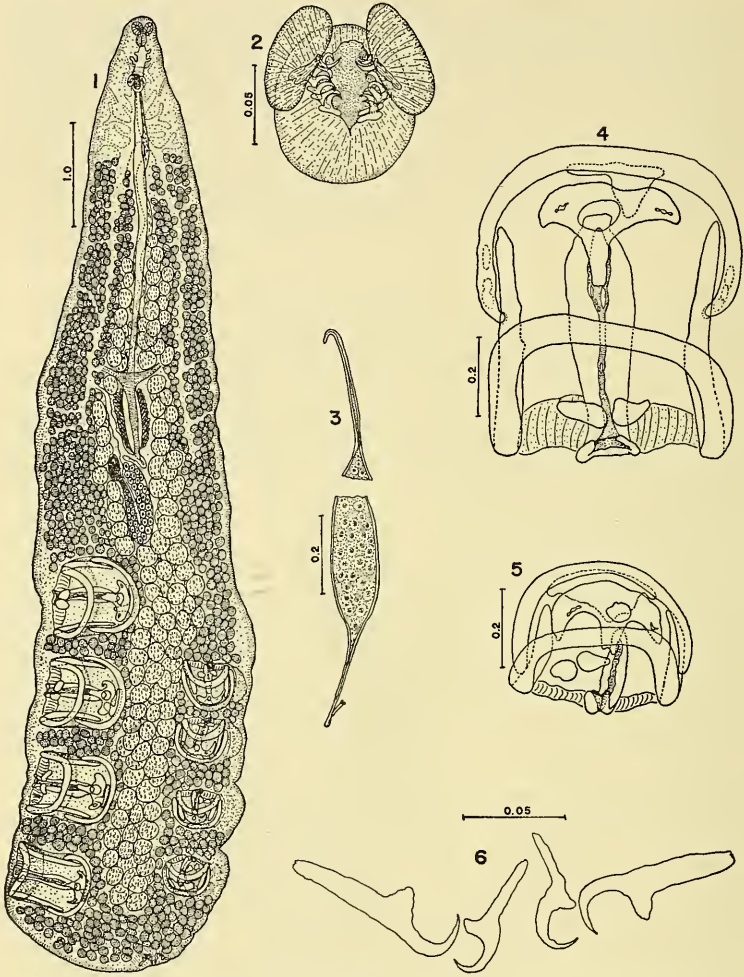
Holotype: USNM Helm. Coll. No. 71191.

Paratypes: USNM Helm. Coll. No. 71192 (5 specimens).

Description: Body elongate, (8) 8,520 (6,800-11,000) long by (8) 1,690 (1,310-1,970) wide; sides tapered gently anteriorly; widened posteriorly to merge inconspicuously with posthaptor. Prohaptor a pair of buccal suckers (6) 97 (90-105) long by (6) 85 (80-94) wide, placed laterally in walls of buccal funnel. Posthaptor bearing four pairs of clamps and two pairs of anchors on a small terminal lappet. Clamps similar in framework, unequal in size; clamps on one side of body (usually the right side) open, large, (19) 816 (493-1,187) long by (19) 717 (501-976) wide, with center piece of clamp parallel to dextrorsinistral axis; clamps on other side of body smaller, closed, (17) 531 (429-615) long by (17) 392 (324-350) wide, with center piece of clamp parallel to anteroposterior axis and at right angles to the large, open clamps. (The side with the larger clamps, right or left, varies individually, but the internal organs maintain a constant orientation regardless of this variance. When the parasite is attached to a gill filament of the host, the larger, open clamps appear to overlap the exposed margin of the filament while the smaller, closed clamps are tightly closed on the lamellae of the filament.) Clamp structure of modified mazocraeid-type (Figs. 4-5). Anchors (Fig. 6) dissimilar in size; outer anchors (8) 65 (53-73) long; inner anchors (7) 53 (48-62) long.

Mouth subterminal, ventral. Pharynx (5) 77 (73-84) long by (5) 70 (62-79) wide; esophagus long, with lateral branches. Gut bifurcated; crura ramified medially and laterally, extending into posthaptor.

Testes numerous, follicular, pre-, para-, and postovarian; testes extending into posthaptor. Vas deferens tightly coiled posteriorly, loosely coiled



FIGURES 1-6. *Neogrubea seriolellae* n. gen., n. sp. 1, Whole mount, ventral view. 2, Genital corona. 3, Egg. 4, Large, open clamp; ventral view. 5, Small, closed clamp; ventral view. 6, Anchors.

anteriorly, running anteriorly in midline to genital atrium. Genital corona consisting of a central, ring-shaped muscular piece (5) 97 (88-107) long by (5) 87 (82-91) wide, armed centrally with 10-14 spines (6) 18 (16-19) long, and a pair of curved muscular pieces anterolateral to muscular ring, each with one large antlerlike spine (5) 35 (32-38) long.

Ovary tubular, folded, with mature end directed anteriorly; oviduct proceeding anteriorly, joining with genito-intestinal canal from right crus and duct from vitelline reservoir before entering ootype. Ootype dorsal to vitelline reservoir, surrounded by Mehlis' glands; uterus ventral, running anteriorly in midline to genital atrium. Vagina apparently absent. Vitellaria follicular, extending from level near gut bifurcation to end of posthaptor; transverse vitelloglands fusing medially to form vitelline reservoir. Eggs somewhat fusiform, with filaments at both ends; eggs (2) 349 (340-357) long (measurement exclusive of filaments). Excretory tubules observed on right and left side near level of genital atrium. Brain situated posterodorsally to pharynx.

FAMILY DICLIDOPHORIDAE CERFONTAINE, 1895

SUBFAMILY EURYSORCHINAE YAMAGUTI, 1963

GENUS *EURYSORCHIS* MANTER AND WALLING, 1958

Eurysorchis australis Manter and Walling, 1958

Host: *Seriolella brama* (Gunther), Warehou and *S. porosa* Guichenot, Silver Warehou; family Stromateidae.

Location: Gills.

Localities: (1) Cape Campbell, Marlborough Province, South Island; 10 statute miles NE of Cape Campbell (60 fathoms; hard mud), and (2) Akaroa, Canterbury Province, South Island; Akaroa Harbour (4-10 fathoms; mud-sand-mussels).

Previously Reported Host and Locality: *Seriolella brama* (Gunther) from Wellington, New Zealand (Manter and Walling, 1958).

Number Studied: 20.

Homoeotypes: USNM Helm. Coll. No. 71193 (4 specimens).

Discussion: Manter and Walling (1958) described *Eurysorchis australis* from the gills of *Seriolella brama* collected at Wellington, New Zealand. In the present study this species was recovered from the gills of *S. brama* and *S. porosa*, the latter being a new host record for this species.

SUBFAMILY DICLIDOPHORINAE CERFONTAINE, 1895

GENUS *DICLIDOPHORA* DIESING, 1850

Diclidophora coelorhynchi Robinson, 1961

Host: *Coelorhynchus australis* (Richardson), Rat Fish; family Macrouridae.

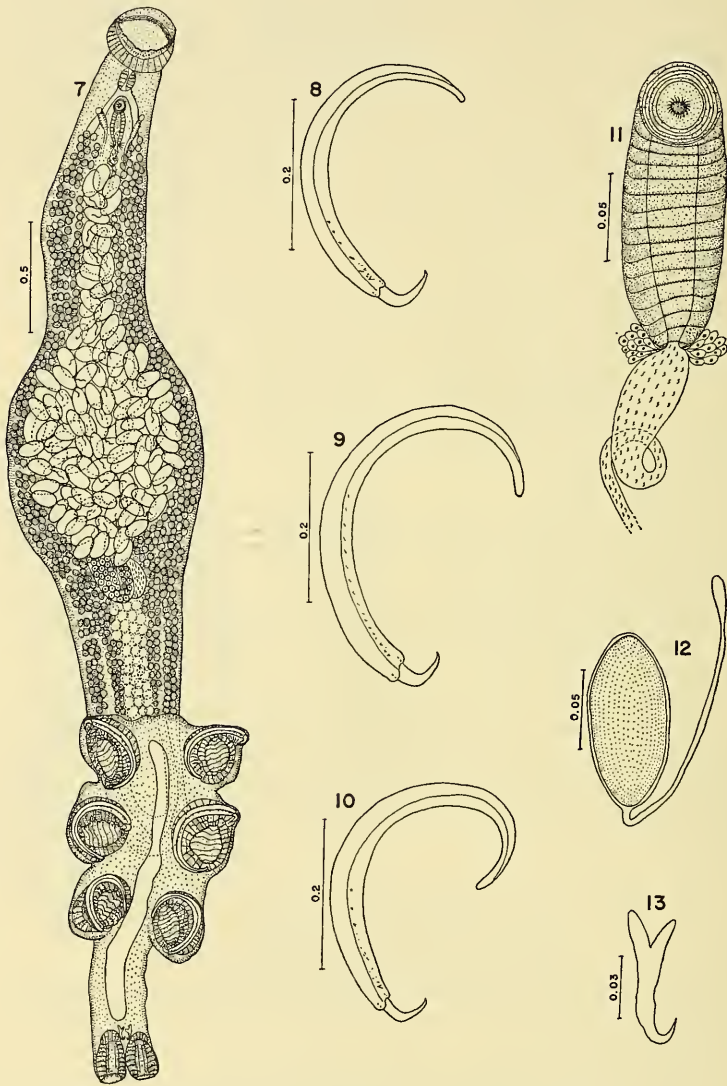
Location: Gills.

Locality: Cape Campbell, Marlborough Province, South Island; 10 statute miles NE of Cape Campbell (60 fathoms; hard mud).

Previously Reported Host and Locality: *Coelorhynchus australis* (Richardson) from Cook Strait, New Zealand (Robinson, 1961).

Number Studied: 43.

Discussion: A study of the original description established the con-



FIGURES 7-13. *Hexabothrium akaroensis* n. sp. 7, Whole mount, ventral view. 8, Anteriormost sclerite. 9, Middle sclerite. 10, Posterior-most sclerite. 11, Cirrus. 12, Egg. 13, Anchor.

specificity of Robinson's (1961) worms with the population in the present collection.

SUPERFAMILY POLYSTOMATOIDEA PRICE, 1936

FAMILY HEXABOTHRIIDAE PRICE, 1942

Genus *Hexabothrium* Nordmann, 1840***Hexabothrium akaroensis*** new species

Figs. 7-13

Host: *Galeorhinus australis* Macleay, Southern Tope or School Shark; family Carcharhinidae.

Location: Gills.

Locality: Akaroa, Canterbury Province, South Island; Akaroa Harbour (4-10 fathoms; mud-sand-mussels).

Number Studied: 5.

Holotype: USNM Helm. Coll. No. 71194.

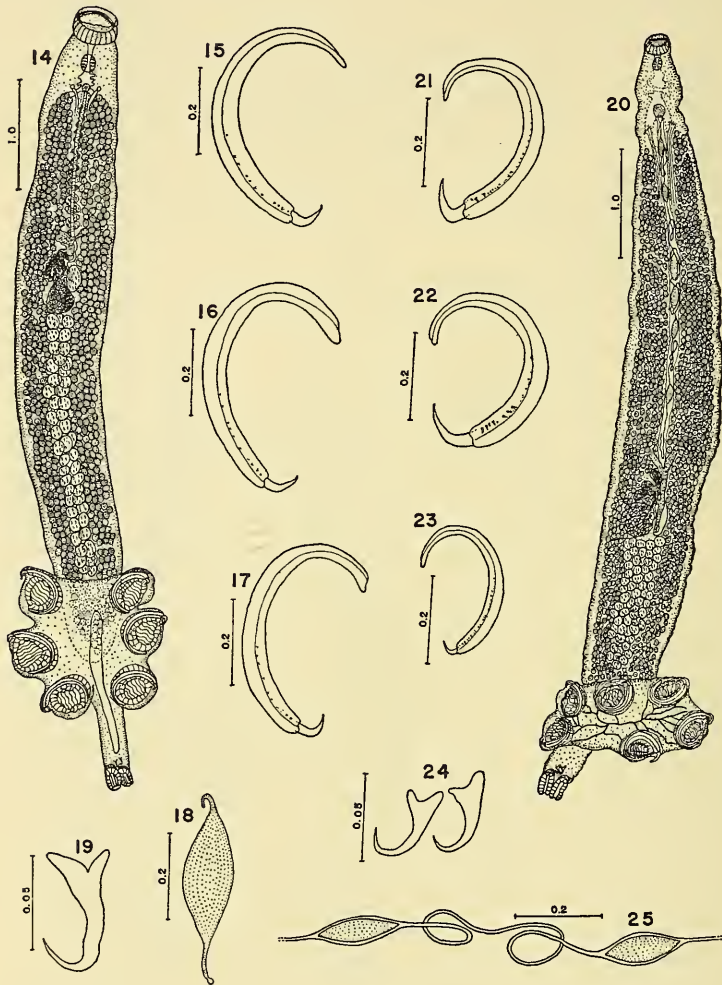
Paratype: USNM Helm. Coll. No. 71195.

Description: Body elongate, (4) 4,600 (4,330-5,100) long (measurement not including appendage) by (2) 915 (840-990) wide. Cuticle relatively thick; sometimes undulant. Prohaptor an oral sucker, (4) 272 (246-299) long by (4) 370 (295-467) wide; sclerotized papillae on rim and inner surface of oral sucker; preoral hood or membrane moderately developed. Posthaptor (4) 1,190 (1,120-1,260) long by (4) 810 (730-980) wide, armed with three pairs of sclerotized suckers, with each sucker possessing a large hooklike sclerite; rims of suckers with minute, conical, sclerotized papillae; striae in lumen of sucker. Hooklike sclerites typically hexabothriid in shape nearly equal in size; anteriormost sclerite (opposite to appendage) (4) 316 (293-339) long; middle sclerite (4) 358 (352-364) long; posteriormost sclerite (adjacent to appendage) (3) 313 (293-327) long. Hooklike sclerites with spines along their lateral margins. Appendage (4) 809 (573-1,013) long, armed with two anchors and two barrel-shaped suckers; anchors (4) 67 (66-71) long; suckers (4) 261 (236-286) long.

Mouth slightly subterminal, ventral. Pharynx (2) 107 (99-115) long by (2) 82 wide; esophagus short. Gut bifurcated, with medial and lateral branches; crura confluent posteriorly prior to entering posthaptor and appendix; not branched in posthaptor or appendix.

Testes numerous, postovarian; number of testes not discernible. Vas deferens loosely coiled anteriorly, tightly coiled posteriorly, extending anteriorly in midline to proximal end of cirrus. Muscular cirrus (4) 171 (163-180) long; distal end of cirrus armed with a circle of minute, curved spines (number of spines not clearly discernible); prostate glands emptying into base of cirrus. Genital atrium (4) 63 (55-72) long by (4) 64 (57-66) wide, situated (4) 462 (406-506) from anterior end.

Uterus usually distended, containing numerous eggs; some onchomiracidia free in uterus, suggesting ovoviviparity. Seminal receptacle present. Vagina double, opening just lateral to crura, slightly posterior



FIGURES 14-25. *Erpocotyle squali* (MacCallum, 1931) Price, 1942. 14, Whole mount, ventral view. 15, Anteriormost sclerite. 16, Middle sclerite. 17, Posteriormost sclerite. 18, Egg. 19, Anchor. *Erpocotyle callorhynchi* (Manter, 1955) Yamaguti, 1963. 20, Whole mount, ventral view. 21, Anteriormost sclerite. 22, Middle sclerite. 23, Posteriormost sclerite. 24, Anchors. 25, Eggs.

to level of genital atrium. Vitellaria follicular, co-extensive with intestine, extending from level near base of cirrus to confluent crura; vitellaria apparently not extending into posthaptor or appendage. Eggs (4) 124 (113-134) long by (4) 54 (52-57) wide, with filament at one pole; filament almost twice as long as egg.

Discussion: *Hexabothrium akaroensis* n. sp. differs from *H. appendiculatum* (Kuhn, 1829) Nordmann, 1840, the type species, as follows: (1) smaller body size, (2) larger anchors, (3) larger hooklike sclerites, and (4) host. (Anchor and sclerite size of *H. appendiculatum* was extrapolated from the figures of Cerfontaine, 1899.) *H. akaroensis* n. sp. differs from the other species in the genus; *H. canicula* (Cerfontaine, 1899) Price, 1942 and *H. musteli* (MacCallum, 1931) Price, 1942, as follows: (1) eggs smaller, (2) anchors larger, (3) hooklike sclerites larger, and (4) host.

Genus *Erpocotyle* van Ben. and Hesse, 1863

Erpocotyle antarctica (Hughes, 1928) Price, 1942

Figs. 26-31

Synonym: *Squalonchocotyle antarctica* Hughes, 1928.

Host: *Mustelus antarcticus* Guenther, Gummy Shark; family Carcharhinidae.

Location: Gills.

Localities: (1) Akaroa, Canterbury Province, South Island; Akaroa Harbour (4-10 fathoms; mud-sand-mussels), (2) Timaru, Canterbury Province, South Island; 10 statute miles ENE of Timaru (9 fathoms; sand) and (3) Timaru, Canterbury Province, South Island; 23 statute miles ENE of Timaru (16 fathoms; sand-mud).

Previously Reported Host and Localities: *Mustelus antarcticus* from Port Phillip Bay, Victoria, Australia (Hughes, 1928) and from New Zealand (Manter, 1955).

Number Studied: 50.

Homoeotypes: USNM Helm. Coll. No. 71196 (5 specimens).

Description: Body elongate, (20) 10,600 (8,500-13,200) long (measurement not including appendage) by (20) 1,150 (910-1,460) wide. Cuticle thick, crenulated; surface of body, especially anterior portion, covered with fleshlike papillae. Prohaptor an oral sucker, (20) 444 (390-573) long by (20) 591 (500-819) wide; oral sucker strongly muscular, with rims bearing sclerotized papillae; inner surface of sucker with tubercles. Preoral hood or membrane well developed, armed with sclerotized papillae. Posthaptor armed with three pairs of sclerotized suckers, with each sucker possessing a large hooklike sclerite; conical papillae not observed on rims of suckers; striae in lumen. Hooklike sclerites typically hexabothriid in shape, dissimilar in size; anteriormost sclerite (opposite the appendage), (20) 544 (442-789) long; middle sclerite (20) 654 (535-910) long; posteriormost sclerite (adjacent to the appendage), (20) 576 (485-812) long. Hooklike sclerites bearing spines

along their lateral margins. Disklike sclerites located in posthaptor. Appendage (20) 1,110 (900–1,630) long, armed with two anchors and two barrel-shaped suckers; anchors (20) 54 (51–60) long; suckers (10) 286 (213–380) long by (10) 200 (150–273) wide.

Mouth subterminal, ventral. Pharynx (10) 162 (147–171) long by (10) 125 (99–147) wide; esophagus short. Gut bifurcated, with medial and lateral branches; crura confluent posteriorly, prior to entering posthaptor and appendix; unbranched in either.

Testes numerous, approximately 91–100, postovarian, between intestinal crura. Vas deferens sinuous, broadened posteriorly, narrowed anteriorly, extending anteriorly in midline to proximal end of cirrus; distal end of vas deferens expanded. Cirrus muscular, (10) 500 (364–642) long; base of cirrus surrounded by prostate glands. Genital atrium (10) 217 (182–257) long by (10) 205 (164–267) wide, receiving uterus (ventrally) and cirrus (dorsally); genital atrium situated (10) 866 (740–1,044) from anterior end.

Ovary irregularly multilobed or branched; oviduct extending anteriorly from mature end of ovary, fusing with ducts from vitelline reservoir, and genito-intestinal canal before entering ootype. Uterus extending anteriorly in midline to genital atrium. Seminal receptacle present; duct from seminal receptacle not observed (judging from other members of the group it probably joins the oviduct prior to entering ootype). Vagina double, opening ventrally near lateral margins of body just posterior to level of genital atrium. Vitellaria co-existent with intestine, with some vitellaria extending into posthaptor and appendage (not observed in all specimens); transverse vitelloglands fusing in midline to form vitelline reservoir. Eggs fusiform, with filaments at both ends; eggs *in utero* (12) 214 (182–243) long by (12) 73 (61–83) wide (measurement exclusive of filaments); filaments approximately half the length of the main body of the eggs, not united in chains.

Discussion: This species was inadequately described by Hughes (1928) from *Mustelus antarcticus* collected at Port Phillip Bay, Victoria, Australia. Manter (1955) added a few details to Hughes' description and a new locality record.

The above redescription is given because the original figures and description were incomplete.

Ercocotyle callorhynchi (Manter, 1955) Yamaguti, 1963

Figs. 20–25

Synonym: *Squalonchocotyle callorhynchi* Manter, 1955.

Host: *Callorhynchus milii* Bory, Elephant Fish; family Chimaeridae.

Location: Gills.

Localities: (1) Timaru, Canterbury Province, South Island; 10 statute miles ENE of Timaru (9 fathoms; sand), (2) Timaru, Canterbury Province, South Island; 23 statute miles ENE of Timaru (16 fathoms; sand–mud), and (3) Timaru, Canterbury Province, South Island; 52 statute miles ENE of Timaru (28 fathoms; sand).

Previously Reported Hosts and Localities: (1) *Callorhynchus capensis* Dumeril from Capetown, South Africa, and (2) *C. milii* Bory from Wellington, New Zealand (Manter, 1955).

Number Studied: 16.

Homoeotypes: USNM Helm. Coll. No. 71197 (5 specimens).

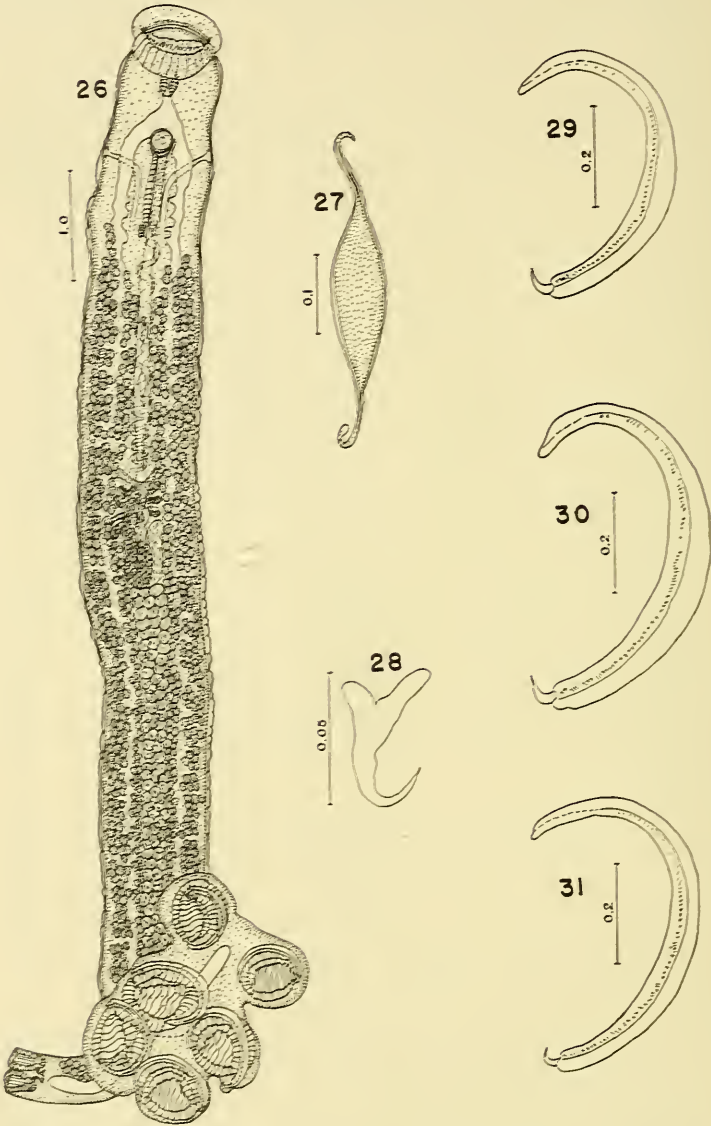
Description: Body elongate, (7) 8,038 (6,370–9,500) long (measurement exclusive of appendage) by (7) 1,068 (924–1,370) wide. Cuticle fairly thick, occasionally undulated; surface of body, especially anterior surface, covered with papillae. Prohaptor an oral sucker (7) 219 (176–248) long by (7) 282 (171–349) wide; sclerotized papillae on rim and inner surface of oral sucker; preoral hood or membrane weakly developed. Posthaptor armed with three pairs of sclerotized suckers with each sucker possessing a large hooklike sclerite; rims and inner surface of suckers armed with sclerotized papillae; striae in lumen; suckers with membranous flange. Hooklike sclerites typically hexabothriid in shape with posteriormost sclerite (adjacent appendage) always smaller than other two pairs; anteriormost sclerite (opposite appendage) (12) 476 (390–540) long; middle sclerite (11) 470 (382–554) long; posteriormost sclerite (adjacent appendage) (11) 356 (293–462) long. Hooklike sclerites with spines along lateral margins. Appendage armed with two anchors and two barrel-shaped suckers; anchors (7) 52 (50–55) long. Disklike sclerites in posthaptor of some specimens.

Mouth ventral, slightly subterminal. Pharynx (5) 91 (78–100) long by (5) 81 (71–86) wide; esophagus short to medium in length, branched. Gut bifurcated; crura with medial and lateral branches, confluent posteriorly prior to entering posthaptor and appendix.

Testes follicular, 46–60 in number, postovarian, between intestinal crura. Vas deferens sinuous, extending anteriorly in midline to proximal end of cirrus; cirrus weakly muscular. Genital atrium (5) 97 (82–110) long by (5) 90 (79–101) wide, situated (6) 636 (589–687) from anterior end.

Ovary irregularly lobed with mature end directed anteriorly; oviduct extending anteriorly, joining genito-intestinal canal and vitelline reservoir before entering ootype. Uterus extending anteriorly in midline to genital atrium. Seminal receptacle not observed. Vagina double, each opening ventrally between midline and lateral margin near level of genital atrium. Vitellaria co-extensive with intestine; not extending into posthaptor or appendage; transverse vitelloglands fusing in midline to form vitelline reservoir. Eggs fusiform, (9) 180 (171–187) long by (9) 70 (59–81) wide; eggs connected by their filaments. Brain posterodorsal to pharynx.

Discussion: A comparison of USNM Helm. Coll. No. 37447 (holotype) and No. 37447 (paratype), from South Africa, and No. 37448 (paratype), from New Zealand, with our population from *Callorhynchus milii* indicated that the present specimens are conspecific with *Erpocotyle callorhynchi* (Manter, 1955) Yamaguti, 1963. Our population agreed in all particulars with the paratype from *Callorhynchus milii* from New Zealand. In the comparison of the holotype and paratype from *C.*



FIGURES 26-31. *Erpocotyle antarctica* (Hughes, 1928) Price, 1942.
26, Whole mount, ventral view. 27, Egg. 28, Anchor. 29, Anteriormost sclerite. 30, Middle sclerite. 31, Posteriormost sclerite.

capensis (from South Africa) with our population from *C. milii*, one difference was noted. In those specimens from *C. capensis* the points of the hooklike sclerites were considerably longer.

According to Manter (1955) the eggs of *Erpocotyle callorhynchi* are not connected by their filaments. It appears that this is erroneous because in the two paratypes from his collections, which contained numerous eggs *in utero*, and in our population of worms the eggs are connected by their filaments.

Prior to the report of Manter (1955), members of the genus *Erpocotyle* (= *Squalonchocotyle*) had been found only on selachians. They are now known to be present on both selachians and chimaerids. This distribution likely reflects the historic genetic relationship between these two groups of soft-bodied fishes.

Erpocotyle squali (MacCallum, 1931) Price, 1942
Figs. 14-19

Synonyms: *Squalonchocotyle squali* MacCallum, 1931; *S. acanthi* MacCallum, 1931.

Host: *Squalus lebruni* (Valliant), Dogfish Shark; family Squalidae.

Location: Gills.

Localities: (1) Timaru, Canterbury Province, South Island; 23 statute miles ENE of Timaru (16 fathoms; sand-mud), (2) Akaroa, Canterbury Province, South Island; Akaroa Harbour (4-10 fathoms; mud-sand-mussels), and (3) Taiaroa Heads (mouth of harbor to Dunedin), Otago Province, South Island; 3 statute miles E of Taiaroa Heads (17 fathoms; fine sand).

Preciously Reported Host and Locality: From the gills of *Squalus acanthias* Linnaeus collected at Woods Hole, Mass. (MacCallum, 1931; Price, 1942).

Number Studied: 56.

Homoeotypes: USNM Helm. Coll. No. 71198 (5 specimens).

Description: Body elongate, (10) 5,489 (4,310-6,680) long (measurement not including appendage) by (10) 778 (620-1,060) wide. Cuticle relatively thin, sometimes undulant; surface of body, especially anterior portion, covered with fleshlike papillae. Prohaptor an oral sucker (13) 215 (183-269) long by (13) 308 (247-392) wide; oral sucker muscular, with rims and inner surfaces bearing minute, sclerotized papillae. Preoral hood or membrane slightly developed. Posthaptor armed with three pairs of sclerotized suckers, with each sucker possessing a large hooklike sclerite; sclerotized papillae not observed on rims of suckers; striae in lumen. Hooklike sclerites typically hexabothriid in shape, nearly equal in size; anteriormost sclerite (opposite appendage) (14) 428 (337-494) long; middle sclerite (14) 427 (366-480) long; posteriormost sclerite (adjacent appendage) (15) 395 (325-480) long. Hooklike sclerites with a few spines along lateral margins. Disklike sclerites located in posthaptor. Appendage (9) 802 (641-952) long, armed with two anchors and two barrel-shaped suckers; anchors (10) 67 (61-72) long.

Mouth ventral, slightly subterminal. Pharynx (12) 102 (84–117) long by (12) 75 (61–89) wide; esophagus short, with slight branching. Gut bifurcated, with medial and lateral branches; crura confluent posteriorly, prior to entering posthaptor and appendix; unbranched in either.

Testes 40–60 in number, postovarian, between intestinal crura. Vas deferens sinuous, broadened and tightly coiled posteriorly narrowed and loosely coiled anteriorly, extending anteriorly in midline to proximal end of cirrus. Cirrus weakly muscular, (6) 117 (74–167) long; base of cirrus surrounded by prostate glands. Genital atrium small, (8) 31 (26–36) long by (8) 31 (25–37) wide, receiving uterus (ventrally) and cirrus (dorsally); genital atrium situated (11) 503 (420–655) from anterior end.

Ovary irregularly looped; distal end of ovary directed anteriorly. Oviduct convoluted, extending anteriorly from mature end of ovary, fusing with ducts from genito-intestinal canal and vitelline reservoir prior to entering ootype; ootype dorsal to vitelline reservoir, surrounded by Mehlis' glands. Seminal receptacle present. Vagina double, ventral, opening just lateral to crura near level of genital atrium. Vitellaria follicular, co-extensive with crura and not extending into posthaptor or appendage. Eggs fusiform, (8) 231 (210–247) long by (8) 104 (87–135) wide (measurement not including filaments), with filament (usually less than length of egg) at both poles; filaments not forming chains.

Discussion: A comparison of USNM Helm. Coll. Nos. 8133, 8134, and 8135 (a total of eight specimens) with our population from *Squalis lebruni* indicated that the present specimens are conspecific with *Erpocotyle squali* (MacCallum, 1931) Price, 1942.

The above redescription is given because: (1) previous descriptions of this species (MacCallum, 1931; Price, 1942) were incomplete; and (2) certain discrepancies exist between those descriptions and the type material on which they were based.

This fourth of a series on monogenetic trematodes from the southern Pacific Ocean discusses seven species of monogenetic trematodes from New Zealand waters. Two new species are described: *Neogrubea seriolellae* and *Hexabothrium aka-roensis*. *Erpocotyle antarctica* (Hughes, 1928) Price, 1942, *E. callorhynchi* (Manter, 1955) Yamaguti, 1963, and *E. squali* (MacCallum, 1931) Price, 1942 are redescribed. *Eurysorchis australis* Manter and Walling, 1958 and *Diclidophora coeloro-hynchi* Robinson, 1961 are reported.

In Mazocraeidae Price, 1936, the subfamily Neogrubeinae is established to accommodate the new genus *Neogrubea*.

A new locality record is reported for *Erpocotyle squali* and new host records are reported for *E. squali* and *Eurysorchis australis*.

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